

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A plasma processing method comprising:

supporting a substrate to be opposed to an electrode;

setting a variable frequency of high frequency power $f(\text{Hz})$;

setting a variable partial pressure of a reactant gas

$P_r(\text{Torr})$;

setting the plasma processing gas to pressure $P(\text{Torr})$ where $P(\text{Torr})$ satisfies the following relationship

$$2 \times 10^{-7} (\text{Torr}/\text{Hz}) \times f(\text{Hz}) \leq P(\text{Torr}) \leq 500 (\text{Torr})$$

$$P_L(\text{Torr}) \leq P(\text{Torr}) \leq 3.5 \times P_L(\text{Torr})$$

wherein the plasma processing gas is a mixture gas of a reactant gas including gases selected from the group consisting of gases containing silicon atoms and halogen base gases with an inert gas, and the pressure $P_L(\text{Torr})$ is a higher pressure of either one represented by the following relationship

$$P_L(\text{Torr}) = 5 \times P_r(\text{Torr}) \text{ or}$$

$$P_L(\text{Torr}) = 2 \times 10^{-7} (\text{Torr}/\text{Hz}) \times f(\text{Hz});$$

and an inert gas;

supplying high frequency power between the electrode and a holder to generate plasma between the electrode and the substrate on the basis of a plasma processing gas; and

performing plasma processing on the substrate utilizing the generated plasma.

2. (Cancelled).

3. (Cancelled).

4. (Previously Presented) The plasma processing method according to claim 1, wherein the pressure $P(\text{Torr})$ of the plasma processing gas is set to satisfy the following relationship

$$5xP_r(\text{Torr}) \leq P(\text{Torr})$$

where $P_r(\text{Torr})$ is partial pressure of the reactant gas.

5. (Previously Presented) The plasma processing method according to claim 1, wherein the pressure $P(\text{Torr})$ of the plasma processing gas is set to satisfy the following relationship

$$P(\text{Torr}) \leq 3.5xP_L(\text{Torr})$$

where the pressure $P_L(\text{Torr})$ is a higher one of a pressure represented by the following relationships

$$P_L(\text{Torr}) = 5xP_r(\text{Torr})$$

$$P_L(\text{Torr}) = 2x10^{-7}(\text{Torr/Hz}) \times f(\text{Hz})$$

where $P_r(\text{Torr})$ is a partial pressure of the reactant gas.

6. (Original) The plasma processing method according to claim 1, wherein the frequency $f(\text{Hz})$ of the high frequency power is

at least 10MHz and at most 500MHz, and the pressure P(Torr) of the plasma processing gas is at least 100Torr and at most 500Torr.

7. (Original) The plasma processing method according to claim 2, wherein the inert gas is a He gas.

8. (Previously Presented) The plasma processing method according to claim 1, wherein the plasma processing method is one for performing film forming processing on the substrate.

9. (Previously Presented) The plasma processing method of claim 1, wherein the plasma processing method is one for performing etching on the substrate.

10. (Previously Presented) The plasma processing method of claim 1, wherein the plasma processing method is one for performing surface treatment on the substrate.